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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/050,539	01/18/2002	Sunao Ishizaki	NA04	7739

24998 7590 05/31/2002

DICKSTEIN SHAPIRO MORIN & OSHINSKY LLP
2101 L STREET NW
WASHINGTON, DC 20037-1526

EXAMINER
NGUYEN, LAM S

ART UNIT	PAPER NUMBER
2853	

DATE MAILED: 05/31/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/050,539	ISHIZAKI, SUNAO	
	Examiner	Art Unit	
	LAM S NGUYEN	2853	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-8 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-8 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 18 January 2002 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 7 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Objections

1. Claim 7 is objected to because of the following informalities:

On page 17, line 4: the word "AND" after "CONNECTED" should be replaced by ON.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in-
> (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or
> (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

2. Claims 1, 3, 5 are rejected under 35 U.S.C. 102(e) as being obvious over Mitsuhashi et al. (US 6273538).

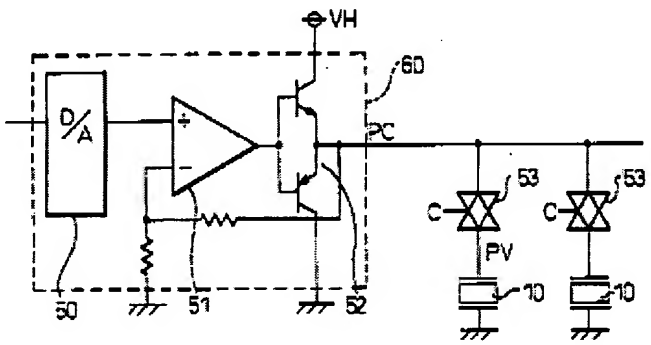
Mitsuhashi et al. discloses a drive circuit of an ink jet head having nozzles (FIG. 1, element 41), pressure generating chambers (Fig. 1, element 20) filled with ink to be jetted from said nozzles and piezo-electric actuators (FIG. 1, element 12) provided correspondingly to respective said pressure generating chambers, for jetting ink droplets from said nozzles by changing volumes of said pressure generating chambers by applying a drive waveform signal to said piezo-electric actuators, comprising:

a waveform generator (FIG. 5, element 60) for generating the drive waveform signal (FIG. 5);

a power amplifier (FIG. 5, element 51 and 52) for amplifying the drive waveform signal supplied to one input of said power amplifier and outputting it to said piezo-electric actuators (Fig. 5);

a feedback loop (FIG. 5: the resistor connected from the negative input of element 51 to the PC point) including for feeding back a terminal voltage of said piezo-electric actuators to the other input of said power amplifier (Fig. 5).

Fig.5



Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 2, 4, 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mitsuhashi et al. (US 6273538) in view of Katerberg et al. (US 5384583).

Mitsuhashi et al. discloses the claim invention as applied to claims 1, 3, 5 except that the feedback loop for feeding back the terminal voltage of said piezo-electric actuators includes a capacitor for leading to signal phase in high frequency range.

However, Katerberg et al. discloses that the feedback loop for feeding back the terminal voltage of said piezo-electric actuators includes a capacitor for leading to signal phase in high frequency range (FIG. 2, element 40).

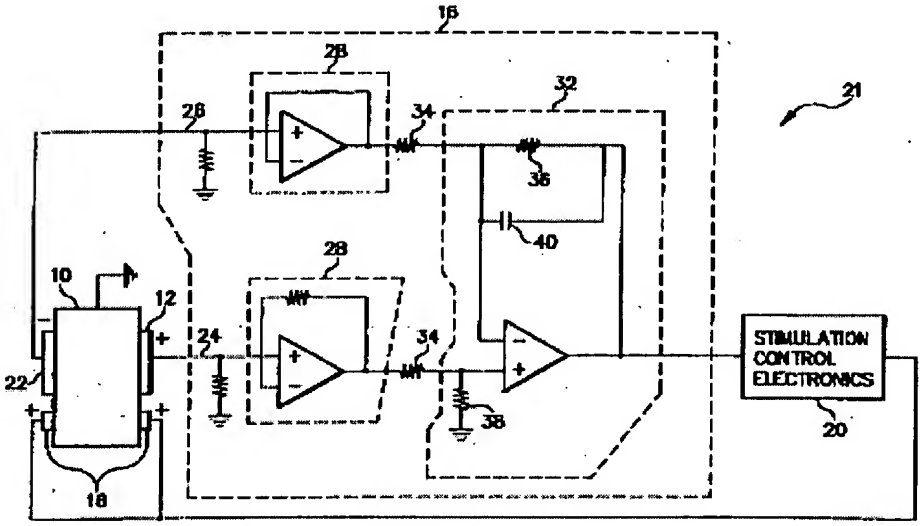


FIG. 2

Therefore, it would have been obvious for one having ordinary skill in the art at the time the invention was made to include such capacitor as designed by Katerberg et al. into the design of Mitsuhashi et at. because this capacitor prevents oscillation in order to gain the stability of the operation of the amplifier as taught by Katerberg et al. (column 3, line 55-60).

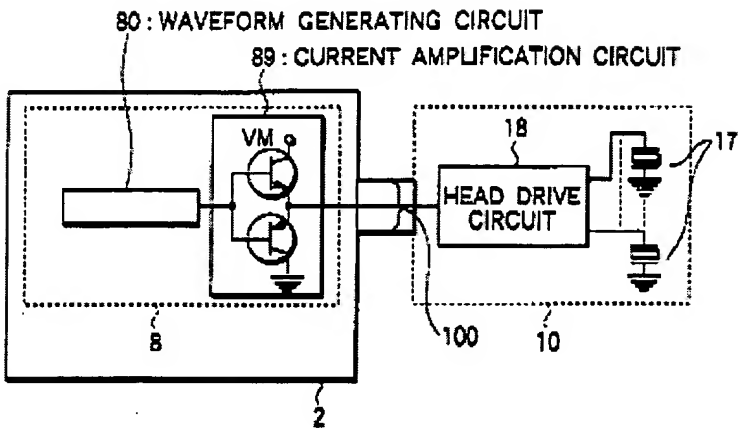
4. Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Isamoto (US 6334668) in view of Katerberg et al. (US 5384583).

Isamoto discloses a drive circuit of an ink jet head of a serial type ink jet printer, which includes a carriage mounting nozzles (FIG. 7A) and pressure generating chambers and in which ink droplets are jetted from the nozzles by sharply changing volumes of said pressure generating chambers (FIG. 13A, element 234) filled with ink by applying drive waveform signal to piezo-electric actuators (FIG.13A, element 239) provided corresponding to said respective pressure generator chambers while moving said carriage reciprocally in a direction perpendicular to a feeding direction of a printing sheet (FIG. 1), comprising:

a control circuit board (FIG. 12, element 2) mounting a waveform generator (FIG. 1, element 80) for generating a signal for driving said ink jet head, a power amplifier (FIG. 12, element 89) for amplifying the output signal of said waveform generator, an image memory for storing printing data (FIG. 8, element 4-5), and a data transmitter for transmitting the image data stored in said image memory as a serial data thereon (FIG. 1, element 9);

an intermediate circuit board (FIG. 11A, element 18) mounted on said carriage and mounting a data receiver (FIG. 11A, element 13) for receiving the serial data from said data transmitter, transfer gates (FIG. 11A, element 160) for selecting piezo-electric actuators (FIG. 11A, element 17) on the basis of the received printing data and a level shifter (FIG. 11A, element 160) for matching voltage levels of said data receiver and said transfer gates thereon;

a cable for connecting said control circuit board and said intermediate circuit board each other (FIG. 12, element 100);



Isamoto does not disclose a negative feedback loop including a resistor and a capacitor.

However, Katerberg et al. discloses a negative feedback loop including a resistor (FIG. 2, element 36) and a capacitor (FIG. 2, element 40) to prevent oscillation of the amplifier (column 3, line 55-59).

Therefore, it would have been obvious for one having ordinary skill in the art at the time the invention was made to include such negative feedback loop as designed by Katerberg et al. into the design of Isamoto because this negative feedback loop prevents oscillation in order to gain the stability of the operation of the amplifier as taught by Katerberg et al. (column 3, line 55-59).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LAM S NGUYEN whose telephone number is (703)305-3342. The examiner can normally be reached on 7:00AM - 3:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, JOHN E BARLOW can be reached on (703)308-3126. The fax phone numbers for

the organization where this application or proceeding is assigned are (703)305-3431 for regular communications and (703)305-3432 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

LN

May 29, 2002

MICHAEL NGHIEM
PRIMARY EXAMINER